

Cycle 2 Year 2 APPLIED Science & Technology (STA406) Curriculum Mapping 2011-2012

| | Topic | Depth | Time | Comments |
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| Term 1 | | | | |
| | Magnetism & Electricity <ul style="list-style-type: none"> • Attraction & repulsion • Magnetic field live wire & solenoid • “hand rules” • Electrical charge • Static Electricity & electrical conductivity • Ohm’s law • Circuits • Power & electrical energy • Electromagnetic induction | Detailed with calculations of $R=V/I$, and Power and Energy. | Sept/mid-Oct | Chapter 5 Parts of 416 course Build circuits with light bulbs, switches and circuit boards Can use old 416 lab exams Build electromagnet |
| | Changes in Matter <ul style="list-style-type: none"> • Chemical changes (combustion & oxidation) • Methods to prevent rusting | Qualitative | | Chapter 4 |
| | Energy <ul style="list-style-type: none"> • Law of conservation of energy • Energy efficiency formula • Heat vs temp | Focus on calculations of energy effic. | Mid-late Oct | Chapter 3 Energy effic. Lab of candle vs. oil lamp |
| | Motion & Forces & Fluids <ul style="list-style-type: none"> • Force • Type of force • Equilibrium of two forces • Relationship between constant speed, distance & time • Mass & weight • Archimedes’ principle • Bernoulli’s principle • Pascal’s law | Detailed with calculations of forces and $v=d/t$ | Late Oct | Build a “boat” out of aluminum foil Discuss Archimedes and Bernoulli in detail |
| Term 2 | | | | |

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| | <p>Technical World Materials</p> <ul style="list-style-type: none"> • Constraints (deflection & shearing) • Characteristics of mechanical properties • Heat treatments • Types & properties (plastics, ceramics, composites) • Modification of properties (degradation, protection) <p>Manufacturing</p> <ul style="list-style-type: none"> • Shaping (characteristics of drilling, tapping & threading) • Measurement & inspection (direct measurements, control, shape & position) <p>Graphical Language</p> <ul style="list-style-type: none"> • Multiview orthogonal projection • Functional dimensioning • Developments <p>Standards & representations</p> <p>Electrical Engineering</p> <ul style="list-style-type: none"> • Power supply • Conduction, insulation & protection • Typical controls • Resistor colour bands • Transformation of energy in a light bulb and stove element | <p>Very qualitative and descriptive, Do not spend too much time on “types of materials” or “manufacturing”</p> <p>Need a workshop to demonstrate</p> <p>Detailed, spend time drawing technical objects</p> <p>Quick overview, mostly covered in Chapter 5</p> | <p>Early-mid Nov</p> <p>1.5 weeks at least, mid to late Nov</p> <p>2-3 classes early-mid Dec.</p> | <p>Chapter 12</p> <p>Examples of wood, modified wood, metals, ceramics etc.</p> <p>Classification of plastics lab</p> <p>Plastics versus paper bag debate</p> <p>Need a workshop to demonstrate</p> <p>Build a catapult</p> <p>Drawing assignments in class, lots of practice</p> <p>Chapter 14</p> |
| | COMMON ASSESSMENT (boardwide assessment) | | | Results to be included on Term 2 report |
| Term 3 | | | | |

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| | <p>Mechanical Engineering</p> <ul style="list-style-type: none"> • Adhesion & friction of parts • Linking of mechanical parts • Degrees of freedom • Guiding controls • motion transmission & transformation systems • Speed changes (gear ratios) • Resisting torque & engine torque <p>Lithosphere</p> <ul style="list-style-type: none"> • Minerals and rocks • Energy resources • Contamination | <p>Detailed on links and motion transformation and transmission and gear ratios</p> <p>Qualitative Focus on energy resources</p> | <p>Jan to mid Feb</p> <p>End Feb</p> | <p>Chapter 13</p> <p>use bicycle as example</p> <p>links practical test</p> <p>build a crane</p> <p>Chapter 6</p> <p>energy resources assignment</p> |
| | COMMON ASSESSMENT | | | To be included on term 3 report |
| Term 4 | | | | |

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| | <p>Hydrosphere</p> <ul style="list-style-type: none"> • Catchment area • Energy resources <p>Atmosphere</p> <ul style="list-style-type: none"> • Air mass • Cold front/warm front • Cyclone & anticyclone • Energy resources <p>Space</p> <ul style="list-style-type: none"> • Solar energy flow • Earth-moon system (gravitational effect) • Tides and tidal energy | <p>Focus on energy resources</p> | <p>Early Mar to end Mar</p> | <p>Chapter 6 & 7</p> <p>Soil profile Scratch test – hardness scale Rock and mineral classification lab Gravitational effect and moon/tides Tidal generator Debate on energy resources</p> |
| | <p>Dynamics of Ecosystems</p> <ul style="list-style-type: none"> • Disturbances • Trophic relationships • Primary productivity • Material & energy flow • Decomposers • Chemical Recycling • Factors that influence distribution of biomes • Ecosystems | <p>Very qualitative</p> | <p>Early April to mid may</p> | <p>Chapter 8, 10</p> <p>Outside study (section off area of forest) Pond study Rotting log study Owl pellets Water filter lab Comic strip assignment</p> |
| May/June | COMMON ASSESSMENT - | | | |
| June | COMMON ASSESSMENT Final Tech lab exam | | | |